Health Care Blood Bank Management System - SRS

Software Requirements Specification (SRS)

Health Care Blood Bank Management System

Course: Software Engineering (SEMTZC344)

Group: [Your Group Number]

Project Title: Health Care Blood Bank Management System

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1. Introduction

1.1 Purpose

The Health Care Blood Bank Management System is a centralized digital platform that connects patients, blood donors, and blood bank administrators. It aims to streamline the process of blood donation, inventory management, and blood requests to ensure timely and efficient access to blood for those in need.

1.2 Scope

The application enables:

- Patients to search for and request specific blood types.
- Real-time visibility of blood stock levels.
- Donors to register, find donation camps, and manage their donation history.
- Administrators to manage inventory, oversee requests, and communicate with donors.

1.3 Definitions, Acronyms, and Abbreviations

- **SRS:** Software Requirements Specification
- **ER Diagram:** Entity-Relationship Diagram
- **CRUD:** Create, Read, Update, Delete operations
- **Admin:** Blood Bank Administrator

2. Overall Description

2.1 Product Perspective

This system is envisioned as a modern, web-based platform intended to replace manual logbooks and fragmented communication channels (like phone calls and social media posts) with a single, reliable source of information for blood management.

2.2 Product Functions

- User registration and login for Patients, Donors, and Admins.
- Blood inventory management (adding, updating, and tracking units).
- Search and filter functionality for blood types.
- Blood request submission and status tracking.
- Donor history and eligibility tracking.
- Admin dashboard for analytics and user management.

2.3 User Classes and Characteristics

- **Patient (Recipient):** Searches for available blood, submits requests, and tracks their status.
- **Donor:** Registers to donate, views their donation history, and receives notifications for urgent needs.
- **Admin:** Manages the entire system, including inventory, user accounts, requests, and reporting.

2.4 Stakeholder Needs and Pain Points

Stakeholder	Pain Point / Feedback	System Requirement
Patient	Difficulty finding the right blood type in emergencies.	Real-time, searchable blood inventory.
Patient	Uncertainty about blood availability.	Live stock status updates.
Donor	Unaware of donation camps or urgent needs.	Notification system for camps and emergencies.
Admin	Manual, error-prone inventory tracking.	Digital inventory management dashboard.
Admin	Difficulty managing donor information and communication.	Centralized donor database with contact history.
All	Delays due to slow communication.	In-app notifications and alerts.

3. System Features

3.1 Functional Requirements

For Patients (Recipients)

- **Search Blood:** Search for available blood units by blood group.
- **Request Blood:** Submit a formal request with patient details.
- **Track Status:** View the live status of their request (Pending, Approved, Rejected).

For Donors

- **Donor Registration:** Simple and quick signup process.
- **Profile Management:** Ability to update contact information and view donation history.
- **View Camps:** Find information on upcoming donation events.
- **Notifications:** Receive alerts for low stock of their blood type or urgent needs.

For Admin

- **User Management:** Approve, view, or suspend patient and donor accounts.
- **Inventory Management:** Add new blood units, update stock counts, and mark units as used.
- **Request Management:** View all incoming requests and update their status.
- **Analytics:** View a dashboard with key metrics like demand trends and stock levels.

3.2 Non-Functional Requirements

- **Performance:** Search results and status updates should appear in under 2 seconds.
- **Reliability/Availability:** The system must maintain 99.9% uptime to be available for emergencies.
- **Security:** All personal and medical data must be encrypted, with role-based access control.
- **Usability:** The interface for patients and donors should be extremely simple and clear. The admin dashboard should be comprehensive and efficient.

4. Data Model

4.1 Entity Descriptions

1. **Patient:** PatientID (PK), Name, BloodType, ContactInfo
2. **Donor:** DonorID (PK), Name, BloodType, LastDonationDate
3. **BloodStock:** StockID (PK), BloodType, CollectionDate, ExpiryDate, DonorID (FK)
4. **BloodRequest:** RequestID (PK), PatientID (FK), BloodType, Quantity, Status
5. **Admin:** AdminID (PK), Username, PasswordHash

5. UML and System Diagrams

Use Case Diagram

Use Case Diagram for Health Care Blood Bank Management System

Actors: Donor, Patient, Admin

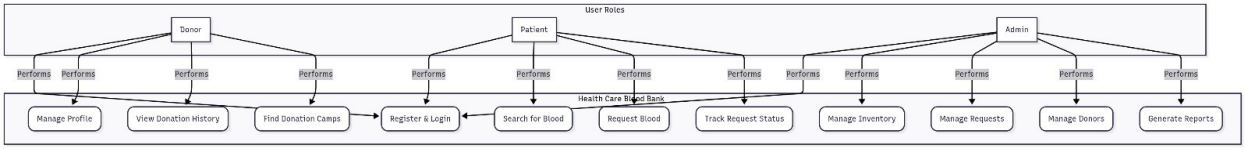
Use Cases:

- Register & Login
- Manage Profile
- View Donation History
- Find Donation Camps
- Search for Blood
- Request Blood
- Track Request Status
- Manage Inventory
- Manage Requests
- Manage Donors

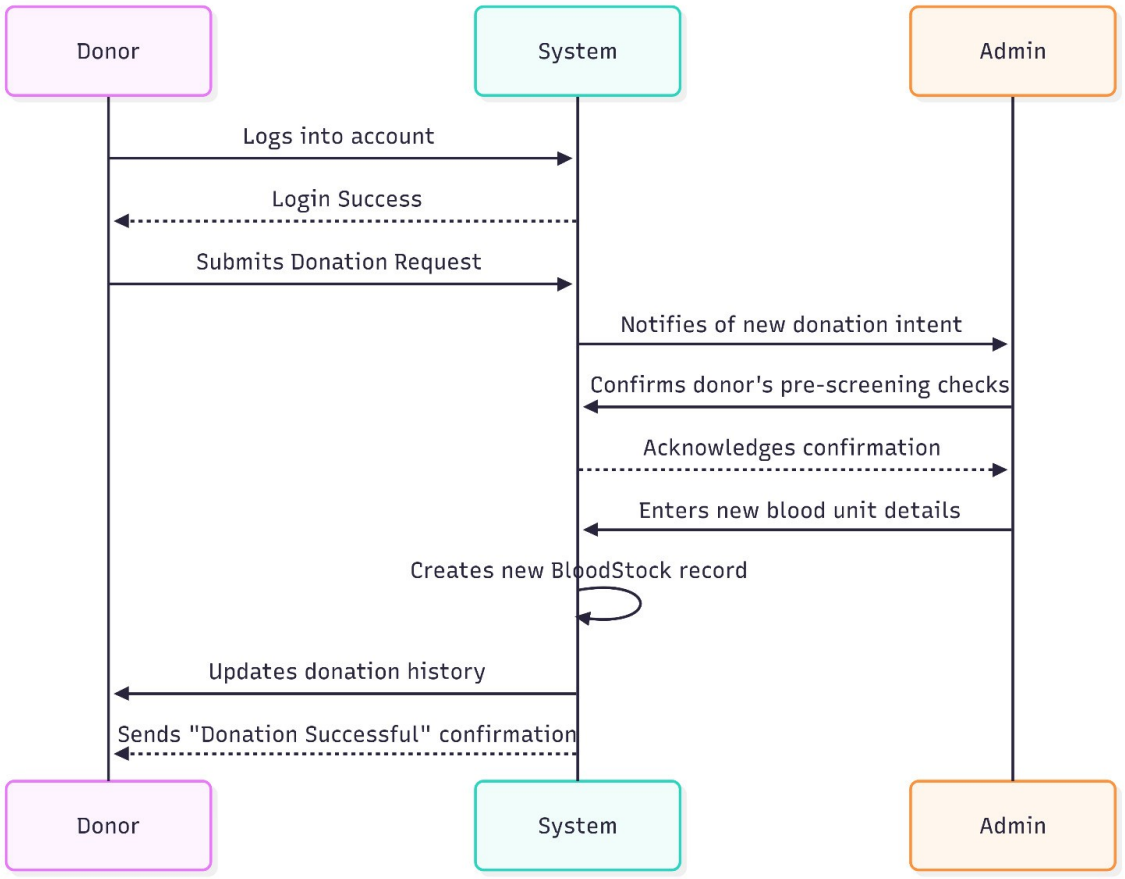
Use Case Diagram

```
graph TD
    subgraph Health Care Blood Bank System
        UC1(Register & Login)
        UC2(Manage Profile)
        UC3(View Donation History)
        UC4(Find Donation Camps)
        UC5(Search for Blood)
        UC6(Request Blood)
        UC7(Track Request Status)
        UC8(Manage Inventory)
        UC9(Manage Requests)
        UC10(Manage Donors)
    end
    subgraph "User Roles"
        actor Donor
        actor Patient
        actor Admin
    end
    Donor -- "Performs" --> UC1 & UC2 & UC3 & UC4
    Patient -- "Performs" --> UC1 & UC5 & UC6 & UC7
    Admin -- "Performs" --> UC1 & UC8 & UC9 & UC10
```

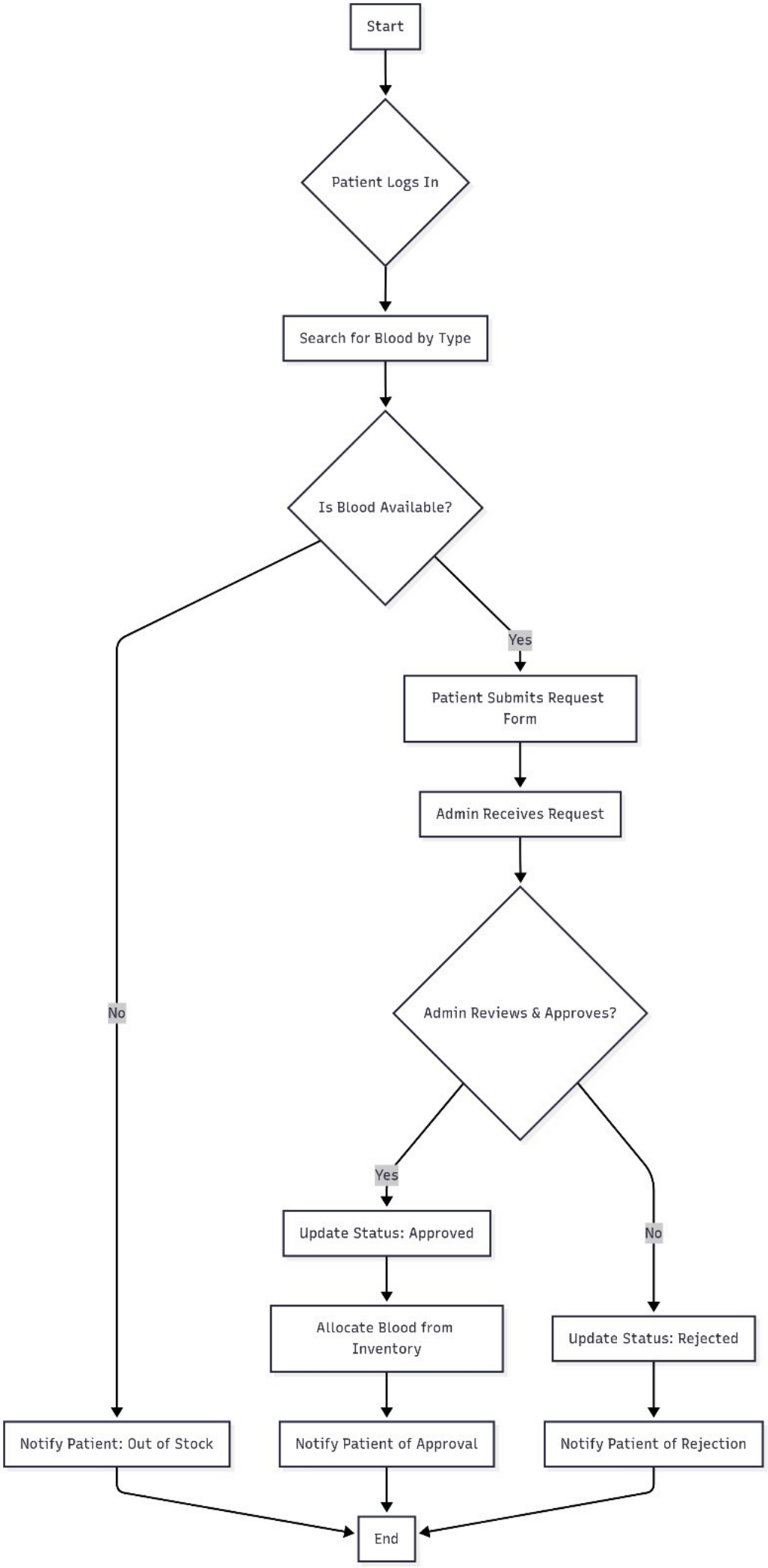
Entity-Relationship (ER) Diagram



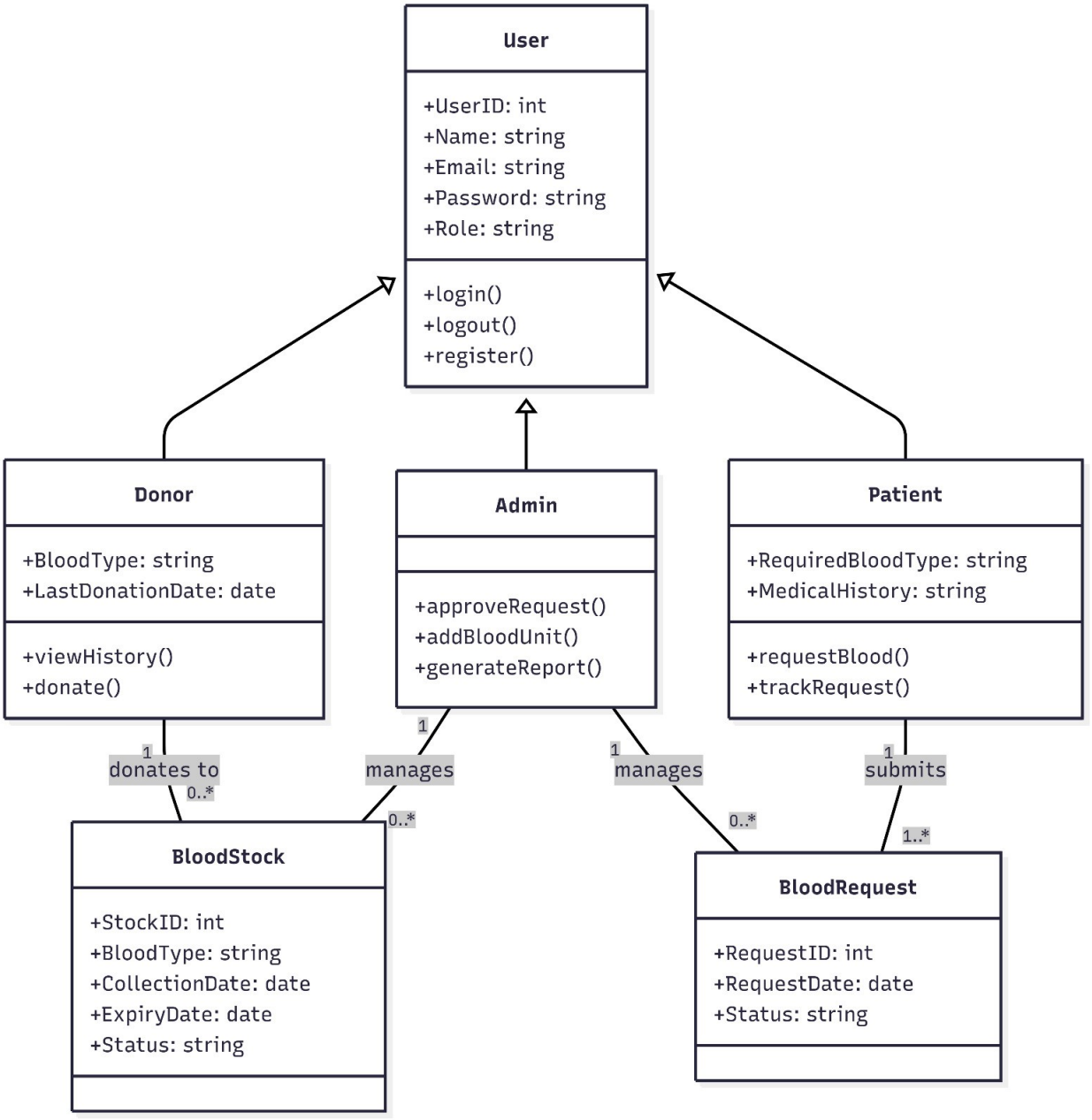
System Architecture Diagram



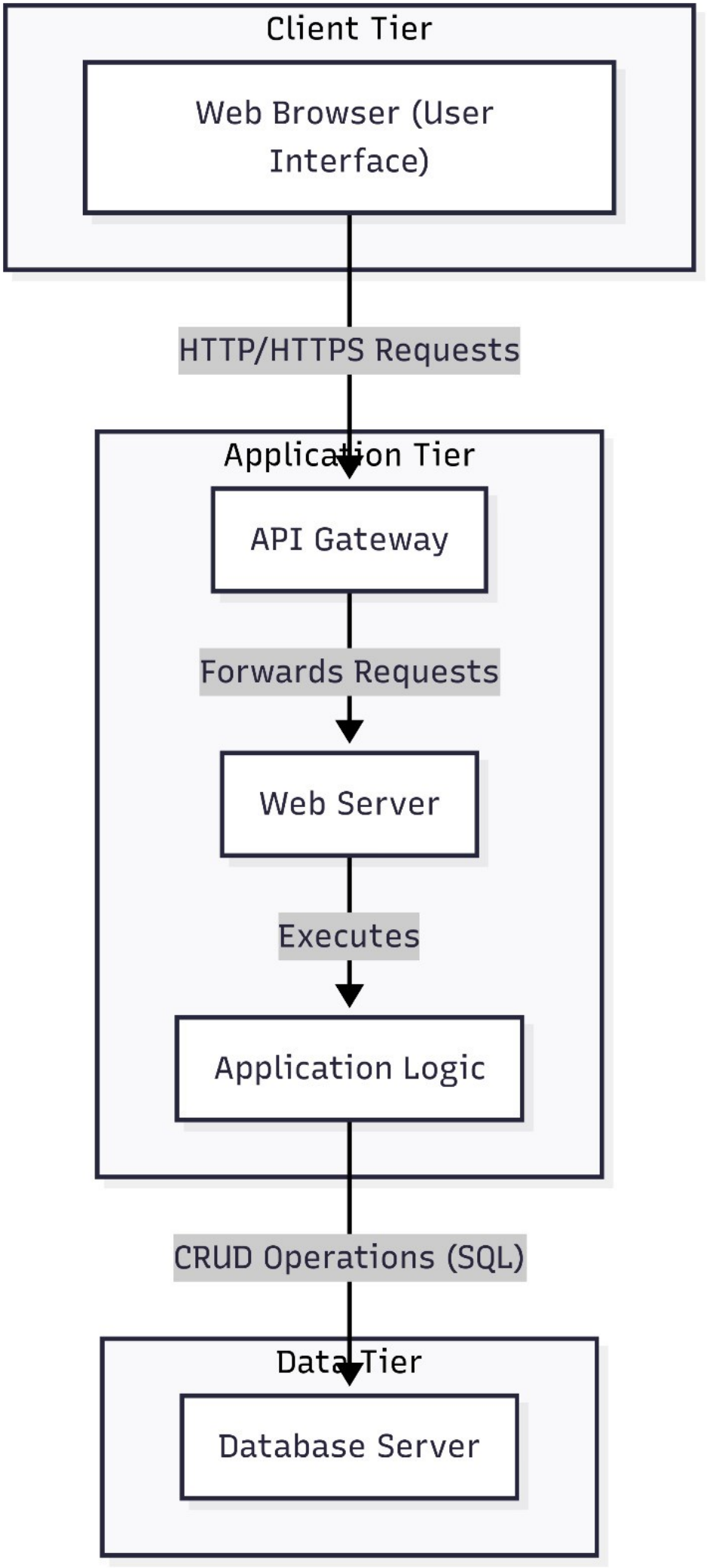
Activity Diagram


Start
Patient Logs In
Search for Blood by Type
Is Blood Available?
Yes
No
Patient Submits Request Form
Admin Receives Request
Admin Reviews & Approves?
Yes
No
Update Status: Approved
Update Status: Rejected
Allocate Blood from Inventory
Notify Patient: Out of Stock
Notify Patient of Approval
Notify Patient of Rejection
End

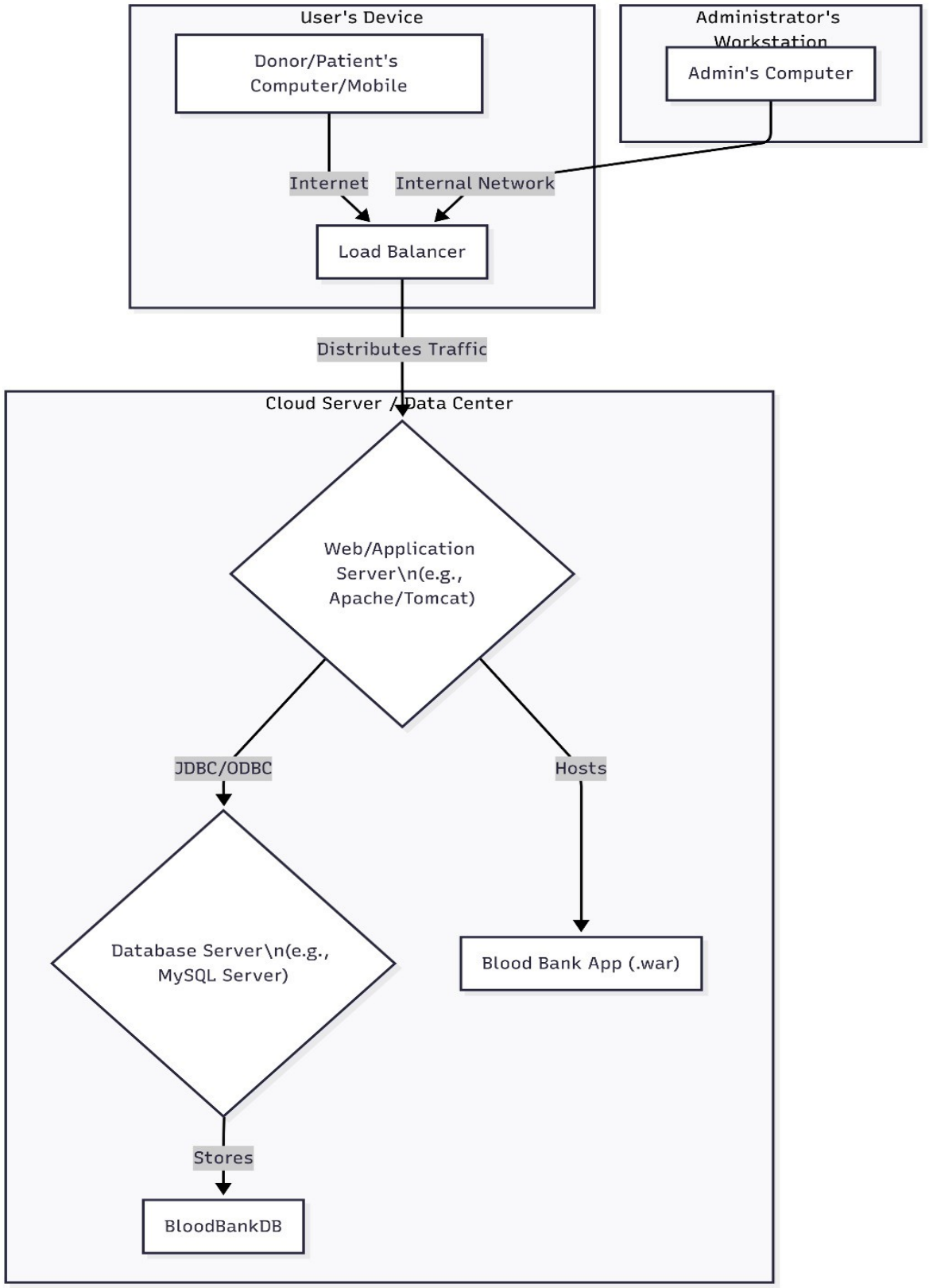
Sequence Diagram



Client-Server Application Architecture


Client Tier
Web Browser (User Interface)
HTTP/HTTPS Requests
Application Tier
API Gateway
Forwards Requests
Web Server
Executes
Application Logic
CRUD Operations (SQL)
Data Tier
Database Server

Deployment Architecture of the Blood Bank System


User's Device
Donor/Patient's Computer/Mobile
Administrator's Workstation
Admin's Computer
Internet
Internal Network
Load Balancer
Distributes Traffic
Cloud Server / Data Center
Web/Application Server\n(e.g., Apache/Tomcat)
JDBC/ODBC
Hosts
Database Server\n(e.g., MySQL Server)
Blood Bank App (.war)
Stores
BloodBankDB

End of Document

Health Care Blood Bank Management System - Software Requirements Specification v1.0